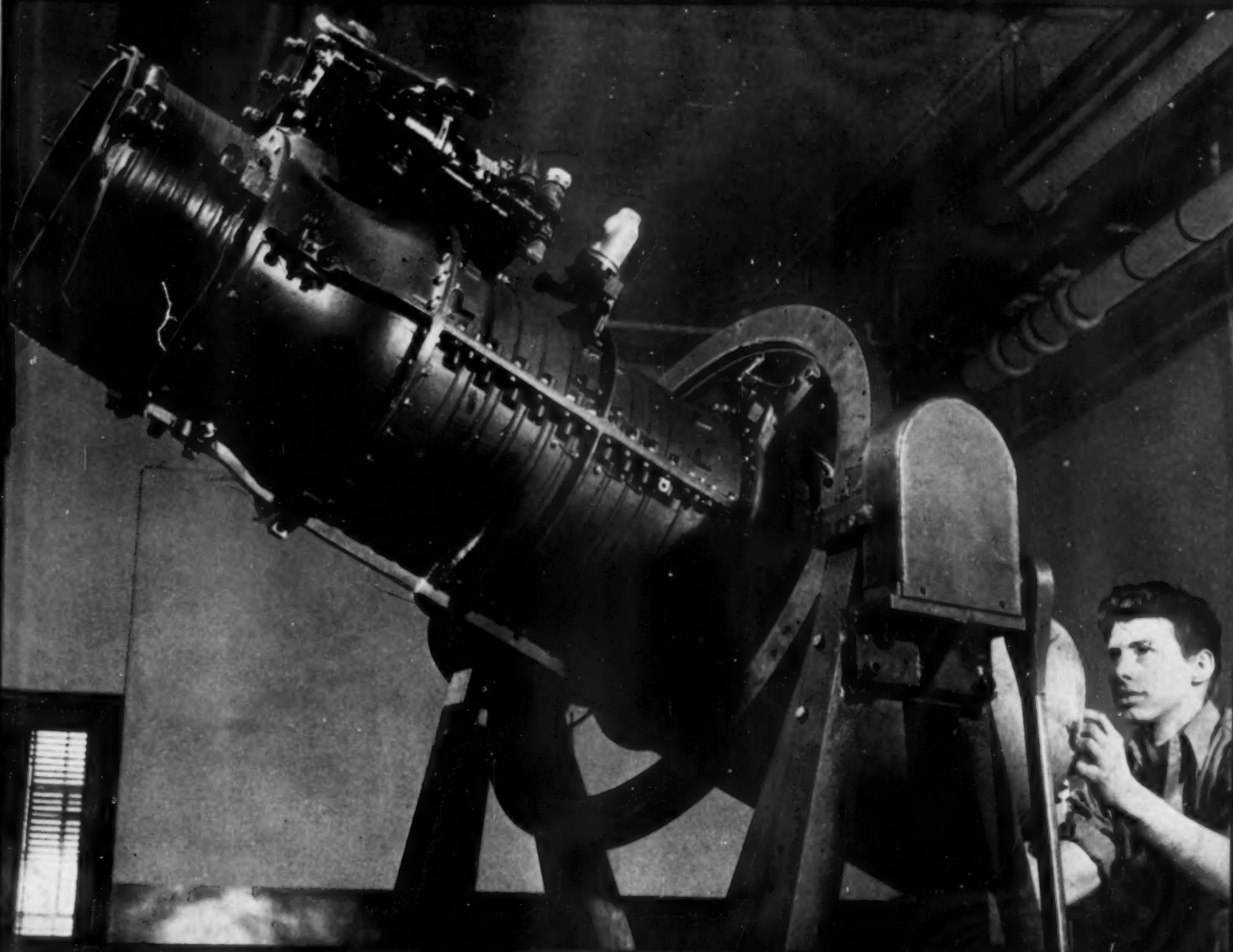


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SCIENCE NEWS LETTER

ONE WEEKLY ISSUE OF CURRENT SCIENCE • FEB. 28, 1948



Jet Power

See Page 136

A SCIENCE SERVICE PUBLICATION



SUSPENDED ELEVATED TRAINS—This is an engineer's concept of what overhead passenger cars will look like. A new company has just been incorporated in New York to install this system which, they hope, holds the answer to congested traffic in cities.

ENGINEERING

Avoiding Traffic Tie-Ups

Claimed advantages of the proposed suspended monorail trains are low cost, rapid construction and high speed of operation.

► **OVERHEAD** passenger cars, running suspended from a single track, were proposed as a solution for city street traffic congestion at the N. Y. Railroad Club meeting in New York by Edward H. Anson.

The idea is not new or untried. An eight-mile route, with trains of from two to five cars, has been in use in Germany since 1901. The present proposal is for a vastly improved design over the German system.

A business organization to install this system, which is known as suspended monorail rapid transit, has just been incorporated in New York. Mr. Anson is vice-president of Gibbs & Hill, Inc., consulting engineers to the new company, Monorailway Corporation. The incorporation follows many years of intensive research in the fields of transportation, engineering and manufacturing.

Low cost, in comparison with conventional elevated railroads and subways, is one of the advantages of the suspended monorail system. It can be constructed more rapidly than other comparable systems, and scheduled speeds of operation are as high as any available rapid

transit rendering the same service.

Monorail operation is quieter than other systems, and its appearance can be made attractive. The design for the supporting structure provides either an arch or a single, T-shaped column, with cantilever arms, each carrying a simple box girder on which the rails are placed. The structure does not darken the street below as in the case of the ordinary elevated railway construction.

The cars used with the system resemble ordinary passenger coaches but each has two overhead trucks to follow the rail. They are about 48 feet long, a little over nine feet in width, and weigh 15,000 pounds. They seat 48 passengers. Their center of gravity is directly below the center line of the rail. Due to this fact the car tends to restore itself to normal position if caused to swing for any reason.

The monorail system is suitable for interurban transportation as well as for use within urban areas. Speeds of 100 miles an hour are entirely possible, Mr. Anson declared. It offers a more comfortable and pleasant service to passengers than other systems, he said.

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SOCIOLOGY

Urbanized States Found To Have Low Crime Rate

► **COUNTRY FOLKS** no longer need to fear the "wickedness" of the cities. Recent statistics show that states with the most city dwellers have less crime than do their country cousins.

This is one of the facts disclosed by a 10-year survey of crime reported by Dr. Austin L. Porterfield of Texas Christian University, Fort Worth, Texas.

Crime declined during the war in a majority of the states. Dr. Porterfield has a simple explanation for that—a great many men of crime-committing age had gone to war. When they returned the crime rate in those states started climbing again.

But some parts of the country had more crime during the war than they did before. This seems to have been due to the huge influx of outside populations into war-industrialized areas. Crime among these "displaced" civilians was greater than was normal for the region.

Types of crime, as well as amount of crime, vary in different parts of the country. Illinois and California were found to be strong for robbery, both before the war and later. Louisiana and North Carolina, in contrast, had relatively few crimes of this type. But Louisiana and North Carolina had lots of murders and aggravated assault, the figures indicate, whereas Illinois and California did not have so much violence of this kind.

The difference, Dr. Porterfield believes, depends on the culture and also on circumstances. No one robs banks, he points out, where there are no banks to rob and shoplifting depends on the presence of shops.

But Dr. Porterfield does not believe that the Negro can be blamed for the high crime rate in some parts of the South. He is not responsible, Dr. Porterfield says, for the high rates of auto theft in the South; he does not specialize in this kind of crime. And neither does the Negro have a monopoly on crimes of violence.

In general, Dr. Porterfield concludes, crime is less where people are well off, socially and financially. And it is because the states where the social well-being is greatest are also the most "citized" that crime rates tend to be lower in the more urbanized parts of the country.

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BACTERIOLOGY

Humidity Kills Germs

Air-borne disease germs could be checked in schools, offices and theaters by a relative humidity of 50%, which seems to be lethal.

► A RELATIVE humidity of 50% swiftly kills disease germs in the air.

This discovery by Edward W. Dunklin and Dr. Theodore T. Puck of the University of Chicago may give us a new, simple way of stopping the spread of diseases like pneumonia, colds, 'flu and others whose germs spread through the air.

It may also explain why such diseases spread rapidly at some seasons and not at others. It might give scientific evidence for the phrase, "pneumonia weather," used by our grandmothers.

The discovery was made in studies with Type I pneumonia germs, staphylococci and streptococci, the latter the cause of serious sore throats, scarlet fever and other ailments. Whether viruses and other disease germs are similarly affected has not yet been determined. But using humidity, in schools, offices, theaters and the like, to check the spread of disease would be so simple that it would be worth while even if only partly beneficial, as the scientists point out.

The humidifying would have to be done exactly. A 50% relative humidity is rapidly lethal to the germs studied but they can survive a long time at higher and lower relative humidities.

At 50% relative humidity the pneumonia germs the scientists sprayed into an experimental air chamber were all dead in less than 10 minutes. But at relative humidities of 80% and 20% many germs survived for over two hours.

The 50% relative humidity that is deadly to germs would not be uncomfortable for humans indoors. Climatologists have found that whether the air is wet, dry or humid makes very little difference in comfort so long as the temperature ranges between 50 and 68 degrees Fahrenheit. That upper temperature level and the approximately 72 degrees Fahrenheit temperature of the studies with germs are fairly close to each other and to the usual indoor temperatures. Temperatures in the fifties and nineties make a difference in the germ-killing effect of humidity.

The 50% relative humidity kills the germs by dehydrating them to the point

where they become most vulnerable to the action of sodium chloride, the ordinary salt we use for seasoning food. When the germs were suspended in distilled water, instead of broth, and then sprayed into the air, they did not die as fast at 50% relative humidity. But

when sprayed from a salt solution, or from human saliva, which is the natural way they get into the air, they were rapidly killed, just as when sprayed from broth.

Measurement of the rate of settling of droplets showed that the disappearance of the germs from the air at 50% relative humidity was a true killing process and not a sign of collision of germs with the sides of the air chamber or with each other.

Details of the experiment are reported in the *Journal of Experimental Medicine* (Feb. 1).

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NUCLEAR PHYSICS

Attack Atomic Secrets

► ROUND, hollow "pill boxes" are at the heart of a new, powerful atom-smasher which has been constructed at Yale University, New Haven, Conn.

The pill boxes are three to seven inches long and weigh approximately 75 pounds. Connected up into what is called a cavity resonator, with high powered amplifiers, the pill boxes will generate an electrical voltage equal to approximately 2,000,000 volts each.

This system, known as a linear accelerator, has already attained 1,000,000 volts. Electrons, light-weight negatively charged atomic particles, are built up to the speed of light to smash the nuclei of atoms in the new effort to unlock atomic secrets.

Yale's linear accelerator was constructed under the direction of Howard L. Schultz, assistant professor of physics, in collaboration with Edward R. Ber-



NEW ATOM-SMASHING ACCELERATOR—"Pill boxes," on the average generating an electrical voltage equal to approximately two million volts each, are at the heart of a new linear accelerator at Yale. It was constructed under the direction of Howard L. Schultz, assistant professor of physics, shown in the picture explaining the system to Carol G. Montgomery, associate professor of physics.

inger, assistant professor of physics, and Carol G. Montgomery, associate professor of physics. The scientists are planning to use the new accelerator to study four major problems:

1. A study of new products produced by nuclear transmutations which convert one element into another.

2. How a fast electron behaves near the nucleus of an atom, and how an electron gets out of the nucleus.

3. Production of powerful X-rays by stopping fast electrons suddenly.

4. How fast electrons absorbed in matter.

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AERONAUTICS

Guide V-2 Rocket's Flight

► A NAZI-BUILT V-2 rocket with an American-made control system is the first of the much-heralded guided missiles.

The V-2 was successfully maneuvered in flight for the first time at the White Sands, N. Mex., Proving Ground. Signals radioed from the ground sent the rocket to the right and left and up and down.

Control is achieved by a device which receives the radio signals and activates the gyroscope which steers the rocket.

As developed thus far, the guided V-2 is still a far cry from the guided missiles which have been proclaimed to be the weapons of the future. But this flight marked the first known success at controlling any portion of a rocket flight from the ground. Months ago, the same system was sent on a "dry run" flight, in which radio signals were received and

sent back by the equipment in the rocket. On that flight, the rocket was not guided in its path, but the radio system was tested. The present flight was made possible by the successful testing which assured that the radio signals would be received by the equipment aboard the rocket.

Rocket experts of the Armed Forces emphasize that the V-2 flight was only a first step toward a guided missile. But they point out that the simple maneuvers are an important control development. The supersonic-speed rocket cannot be made to perform the dives and turns of a small airplane.

Whether or not the controlled V-2 will stand up as the first American guided missile is a problem for historians. Cloaked in secrecy are other missiles, some of which may be guided.

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NUCLEAR PHYSICS

A. E. C. Offers Fellowships

► THE urgent need for men and women equipped to fight radiation danger and to man expanding atomic energy programs has led the U. S. Atomic Energy Commission to establish fellowships for training qualified persons in atomic medicine and biology.

Selection of candidates and administration of the program will be carried out by the National Research Council, with the A. E. C. financing the program, establishing operating policies and training goals. For the first year of the program approximately \$1,000,000 has been budgeted.

The program is expected to continue for about five years. About 75 fellows each year will be physicians and doctors of philosophy in the biological sciences. Their fellowships will be for two years. In addition, the program calls for 100 fellows who are graduates of colleges or universities but without advanced de-

grees, to take one year of training in health physics.

Because the A. E. C. wants its fellows spread widely over the country, selection of universities for fellowship training will depend in part on geographical location. Fellows will have a certain amount of latitude, however, in selection of institutions for their training.

The A. E. C. will have plenty of jobs in its own installations for the men and women after their training, Dr. Shields Warren, A. E. C. interim director for medicine and biology, stated. However, fellows will not have to agree to work for the Commission.

Health and safety of atomic energy workers can be maintained, he declared, with the trained personnel for this work now on hand. But expansion of the atomic energy program will require more of these specially trained workers. And a considerable number of research

fields which should be explored cannot be at present because of the shortage of personnel.

Very important for the future world food situation, Dr. Warren and his associate, Dr. John Z. Bowers, pointed out, is the matter of using radioactive substances for improved utilization of now scarce fertilizer materials. Preliminary investigations indicate, for example, that it may not be as necessary to lime soil as has been believed. Further studies, with tagged atoms, of the uptake by plants of different types of substances may lead to better uses of fertilizers.

Finding how long an insecticide spray will hang onto a leaf may be determined

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by tagging some of the spray's atoms with radioactive isotopes. This might save the orchardist or farmer from spraying as often as he now does, or might show the need for more frequent spraying to save his crop.

Radioactive tracers, or tagged atoms, may not necessarily open up new fields,

Dr. Warren explained, but may help advance science by giving an easier method of working in older fields. As an example of this, he gave the ease with which phosphorus can be determined by the tracer technic compared with the extremely difficult and slow processes of chemical analysis for this element.

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PSYCHIATRY

Check Stammer by Shock

Girl patient can talk and even sing for the first time in 13 years after treatment with electric shock. Her condition believed to have been neurotic.

► A YOUNG girl who stammered so badly that she could speak only in occasional monosyllables was enabled to talk freely and even to sing as a result of treatment with electric shock at the Owen Clinic, Huntington, W. Va.

The girl, whose name is not disclosed by her physicians, has stammered since she was seven years old. She is now 20.

She had graduated from high school in spite of her severe handicap and had been able to maintain a "B" average. She also had many girl friends and enjoyed going to movies and dancing. She had few boy friends, however. She studied business subjects in high school, not because she had particular interest in commerce, but because she thought it offered her the best chance of becoming independent economically.

Treatment at the clinic was started in the usual orthodox manner. She was encouraged to relax and given continuous warm baths and helped to relax with music. But speaking continued to be a very painful experience although some improvement was noticed.

Then, because the girl was in a great hurry to learn to talk and be able to get a job, the electric shock treatment was tried. There was little change until the fourth treatment, after which the improvement was remarkable. She was given 13 treatments, the last one resulting in a mild convulsion of the type known to physicians as "petit mal." The improvement after that one was even more dramatic than after the others. She was now able to speak normally except that following a visit from her family her stammer which had been negligible became greatly accentuated.

It was found that the girl's chief interest was in nursing and she is now working as a nurse's aide. She works

almost entirely with mental patients and is extraordinarily patient with them.

Drs. Thelma V. Owen and Marguerite G. Stemmermann, in reporting the case to the *American Journal of Psychiatry*, (Dec.), say that the remarkable and immediate improvement of the girl when the electric shock treatment released her inner tension, as well as her relapse when contact with her family was trying for her, indicates that the stammering, at least in her case, was due to a neurotic condition.

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MEDICINE

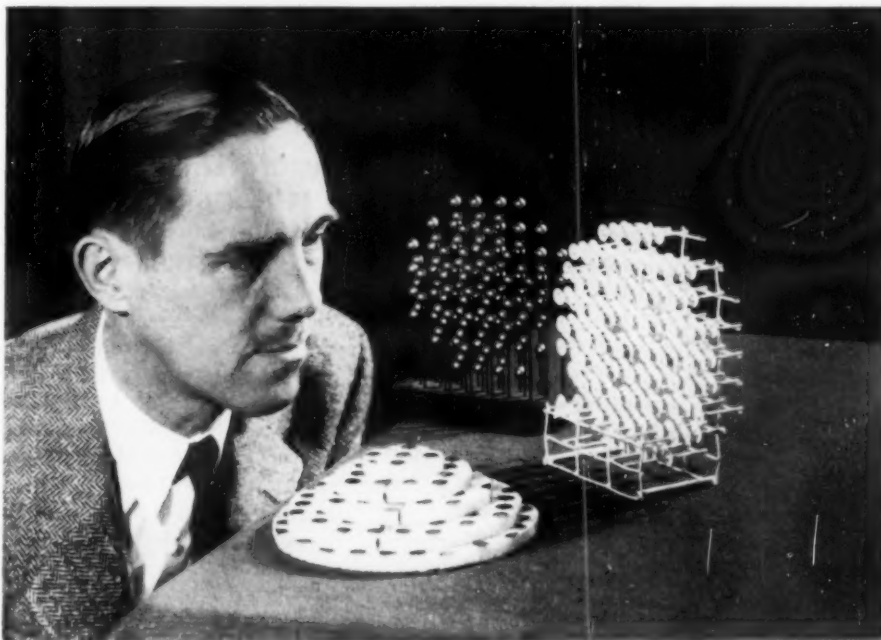
Artery Cutting Operation Relieves Severe Headache

► AN artery cutting operation that gives relief in almost nine out of 10 (87%) of severe headaches is reported by Dr. Walter G. Haynes of Birmingham in the *Journal of the American Medical Association* (Feb. 21).

The headache is a one-sided, paroxysmal pain that radiates into the eye and sometimes is associated with reddening and tearing of the eye. The temporal artery that runs up the side of the head in front of the ear is tender at the time of the headache. Injection of a local anesthetic, procaine, around the artery relieves the headache. The pain is so severe as to be incapacitating. Some patients had attacks two and three times a week.

Cutting out a piece of artery relieves the pain immediately and apparently permanently. In some cases nerve is also torn loose. Nerve fibers crossing the artery are, Dr. Haynes believes, responsible for carrying the pain to the head. In some cases the middle meningeal artery is cut as well as the temporal artery.

The operation when done by a trained



NEW TYPE METAL LENS—It will be used for focussing radio waves in radio relay systems in the way an optical lens focusses light. It is theoretically capable of handling from 50 to 100 television channels or tens of thousands of simultaneous telephone messages, in the proposed radio relay link the Bell System is planning between New York and Chicago. Shown with three different small-scale models of the lens is Dr. Winston E. Kock who developed them.

surgeon is not dangerous. It is done under local anesthetic and the patient usually need not stay in the hospital more than three days.

Dr. Haynes advises this operation for these one-sided headaches when conservative treatment, such as by drugs, X-rays and traction on the neck, fail

to give relief. Patients sometimes have headaches after the operation, but in such cases medicines, sometimes ordinary headache remedies, relieve the pain.

In a series of 47 patients the operation gave relief in 87%. Conservative treatment brought relief in only 32% of 25 patients.

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RADIO-ASTRONOMY

Cosmic Static Jams Radio

► RADIO noises broadcast from the sun and stars cause picture jumpiness and streaking to appear on television, and can drown out FM broadcasting stations, Grote Reber, radio physicist at the National Bureau of Standards, declared.

Mr. Reber discussed cosmic radio sounds as the guest of Watson Davis, director of Science Service, on the Adventures in Science program heard over the Columbia network.

"Cosmic noise from the Milky Way is undoubtedly one of the major factors limiting the distance that FM and television can transmit," said Mr. Reber.

Cosmic static also affects other high frequency equipment such as certain types of radar and aircraft safety instruments. He added that this static doesn't affect the ordinary radio in our homes. This is because the lower frequencies of the cosmic noise which would disturb the standard broadcast band cannot reach the surface of the earth through the ionosphere, an upper layer of the earth's atmosphere.

"Cosmic static begins to interfere on frequencies above 15 megacycles, and begins to slope off above 100 megacycles," Mr. Reber explained. "However, it is at this point that solar static starts to come in."

Static from the stars was first noticed and picked up in 1932, and this was when Mr. Reber began his own study on this subject. In his home town in Illinois, he set up his equipment. A big saucer, 30 feet in diameter, captured the signals from outer space, where they were absorbed by a drum, then transmitted down to a meter which registered the intensity of received radiation. It looked like a giant mushroom, Mr. Reber recalled.

"People there got so used to seeing my equipment that I could always spot strangers in town by the fact that they'd stop to take a look," Mr. Reber said.

He added to the equipment, using

his own money, and worked in the quiet hours of the night when there was less disturbance from passing automobiles.

The project became too big to handle alone, and with the rush to higher frequencies, the results began to have real practical importance. Mr. Reber joined the staff of the Bureau of Standards. His equipment was moved to Virginia and will receive broadcasts from the Milky Way. A set of German Giant Wurzburgs, a radar brought back from Germany, receives broadcasts from the sun.

Next steps are to attempt to pin-point the sources of the two types of static and to study their frequencies and variations. Mr. Reber believes there is the possibility that these radio noises could be used to make an analysis of outer space.

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RADIO

Broadcasting Unit Is Size of Fifty-Cent Piece

► LATEST version of the business tycoon who started "on a shoestring" may be the radio station owner of the future who starts on a half dollar. The "half-dollar radio station" was demonstrated to the local section of the Institute of Radio Engineers in Washington by Dr. Clelio Brunetti, engineer at the National Bureau of Standards.

Dr. Brunetti is the man who carries a whole "network" of radio broadcasting transmitters around in his pockets. He built a radio transmitter which fits conveniently in an empty lipstick container. His "calling card radio" is on a thin plastic card the size of a calling card. And the half-dollar broadcasting unit is on a square which would barely cover a 50-cent piece.

The thin plastic square measures one and one-quarter inches each way. Flat painted lines form the circuits instead of

the wires which are in your radio. Tiny tubes are soldered to the flat surface. Small batteries such as are used in hearing aids supply the power for the sub-miniature station.

But the engineer is even more proud of one of his larger models, a vest-pocket transmitter and receiver which is a duplicate of one Dr. Brunetti presented to President Truman.

If you are looking forward to the day when you will be able to get one of these tiny radios, the National Bureau of Standards has good news for you. A recent survey revealed that more than 65 manufacturers have already begun to use printed circuit techniques in some of their products. So far, these flat, smaller circuits are not finding their way into many radios, but many manufacturers are working on this problem.

At least one hearing aid is now using the printed circuits and plans for two-way personal radios have been announced. When the latter gets on the market, they may find some unique uses. Dr. Brunetti showed the radio engineering group how a large store might use the midget transmitters for a routine inventory. One clerk could count the stock, broadcasting the figures to an office where they would be recorded and tabulated. The idea for this use of the tiny radios came to the Bureau of Standards from an executive of a large chain store.

The Bureau worked on printed circuits for the wartime proximity fuze. Since the war Dr. Brunetti and his staff have shown how these circuits can be used in industry and perhaps one day in your own pocket or handbag.

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ASTRONOMY-GEOGRAPHY

Solar Eclipse to Help Accurate Mapping of Earth

► THE shape and size of the earth will be determined with greater accuracy than ever before when the moon comes between the earth and the sun on May 8-9.

A multiple expedition to Burma, Siam, China, Japan, Korea and the Aleutian Islands, all along the path of the eclipse, is being planned by the National Geographic Society. Simultaneous observations to be made at these points will aid in making better maps of the earth.

Because the path of the eclipse crosses the International Date Line in mid-

Pacific, it will occur on two days. Instead of being a total eclipse, it will be an annular one with the moon appearing slightly smaller than the sun and thus at maximum being surrounded by a narrow ring of light.

The exact time when the moon's edge first touches the sun, when the ring of light first shows around the moon, when the ring disappears as the moon moves on and when the edges of the sun and moon part company, all four will be accurately clocked. These contacts will come at different times at the various observing stations along the eclipse path.

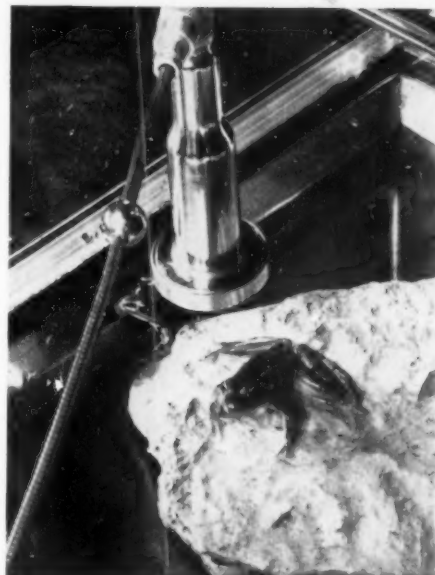
The difference in time of contacts as measured at any two stations makes it possible to calculate with great accuracy the distance between these two stations, and to locate their relative positions on the earth's surface with an

error of not more than 150 feet. This helps determine very exactly the shape and size of the earth.

Measurements of the times of contact of the sun and moon will be made by photographing the eclipse on 35-millimeter sound motion picture film. The one-per-second ticks of a chronometer, checked for accuracy with radio time signals, will be recorded on the sound track. A comparison of the eclipse contact pictures with the time marks on the sound track alongside them will permanently record the exact moment of the contacts.

The U. S. Army's Map Service, Engineers and Signal Corps, the Navy, Air Force, Bureau of Standards, Coast and Geodetic Survey and State Department are cooperating with the Society in the project.

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RADIOACTIVE FROGS—Visitors to the Atomic Energy exhibit at the Museum of Science and Industry in Chicago have the privilege of operating a detector probe which turns on blue, green and red lights as the "hot" or radioactive frogs are approached. This dramatizes for the layman the use of radioactive substances employed as "tracers" in the fields of biology and preventive medicine.

MEDICINE

Conflict Root of Illness

Patient described as filibustering in the doctor's office in an unconscious attempt to hide the root of his illness, which is body's reaction to mental conflict.

► **FILIBUSTERING** is a medical symptom, says Dr. Andrew D. Hart, of the University of Virginia School of Medicine.

The filibustering he described is that done by patients in doctors' offices, not the Senatorial variety.

He lists it with other symptoms of psychosomatic illness in a report to the *Journal of the American Medical Association* (Jan. 24).

The patient who filibusters is doing it in an unconscious attempt to keep the doctor from finding out what is really causing the illness. Dr. Hart gives as an example a 50-year-old woman confined to a wheel chair with deforming arthritis, or rheumatism. For the five years she had been rheumatic, she successfully resisted efforts to start proper treatment of her symptoms.

Each time she saw the doctor, she took up the entire time with an exhaustive account of her numerous symptoms and feelings, or would get onto discussions of politics and what her family and friends were like and what they said. Every time the doctor tried to steer the interview back to what things in her life or personality might account for the arthritis the patient got off onto another

subject and did some more filibustering.

Patients with stomach ulcers, heart disease, overweight and headaches may do the same thing, if their physical symptoms and illness are psychosomatic. The psychosomatic illness, Dr. Hart explains, is the body's reaction to mental conflict so severe that it has to be repressed. Unconsciously the patient feels that even painful, disabling physical symptoms are not as bad as the conflict of feelings he is repressing. So, though he consciously wants to feel better, he unconsciously resists efforts to get at the cause of his troubles.

Procrastination in seeking treatment, self-treatment, "medical shopping," sabotage of treatment and patronizing medical cults are other symptoms Dr. Hart says will help diagnose psychosomatic illness.

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MEDICINE

New Test for Pregnancy Utilizes Common Frogs

► **MALE** frogs of the commonest American species can now be used as test animals in detecting early pregnancy in women. They will be used in place

of the much more costly tropical frogs and toads recently recommended and the mice used in the first technique of the kind to be described, known as the Ascheim-Zondek test.

The new test is described by a Columbus physician, Dr. P. B. Wiltberger, and Prof. D. F. Miller of the Ohio State University, in *Science*, (Feb. 20). A small quantity of urine from the patient is injected into the body of a male leopard frog. If she is pregnant, the frog begins to discharge his male sex cells in from two to four hours.

For the sake of certainty, Dr. Wiltberger recommends the use of two or more frogs for each test. This does not involve any appreciable extra expense, partly because the frogs are so abundant and easy to obtain in the first place, partly because the same frogs can be used again and again, with four- to five-day intervals between tests.

The leopard frog is the species known to zoologists as *Rana pipiens*. It is the first animal students are given to dissect in beginning zoology courses.

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WILDLIFE

U. S. Handling of Seal Herd Studied by Uruguayan

► URUGUAY possesses the only surviving fur seal herd in the South Atlantic, and for this reason that country's Fisheries Service has had one of its young biologists, Dr. Raul Vas-Ferreira, journey to the far-off Pribilof islands in the Bering sea, to study American methods of management of the great seal herd there. Dr. Vas-Ferreira is now in Washington, completing his studies at the U. S. Fish and Wildlife Service and the National Museum.

The Uruguayan fur seal herd has its shore bases on three groups of small islands off the coast: Lobos, Polonio and Coronilla. Its numbers are not accurately known; Dr. Vas-Ferreira states that estimates vary from 20,000 to 50,000 animals. These, with a few more on islands in the South Pacific area, are the sole survivors of the once numerous herds that were practically exterminated by American and British sealers a century and more ago.

In addition to the fur seals there are on the Uruguayan islands about 10,000 sea lions, and smaller numbers of Antarctic species of seal, as well as a few sea elephants. Numbers of penguins come up from the south every year, drifting on the Falkland current; but they cannot stand the hot summers and invariably die.

No pelts are taken at present from the Uruguayan seal herd, but after Dr. Vas-Ferreira's results have been evaluated and applied, systematic harvesting will begin. The pelts will be sent to this country, to be marketed in St. Louis.

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FISH FARMING

Clams May Join Oysters As Cultivated Sea Crop

► SUCCULENT softshell clams may soon join oysters as a cultivated sea-crop on tidal flats now yielding no food products, if experiments now in progress under the supervision of scientists at the Woods Hole Oceanographic Institution fulfill their present promise.

Vast areas along the North Atlantic coast that once yielded abundance of clams have been completely "clammed out," and will have to be re-colonized with seed clams if they are to be made productive again. The one town of Barnstable on Cape Cod, once famous for its softshell clams, now looks out on

more than a thousand acres of such desert clam flats.

Barnstable's Selectmen decided to do something about it. With typical New England caution, they started with an experimental 75 acres which they leased to a number of local cultivators.

A year ago about a thousand bushels of seed clams, taken from the polluted waters of Boston Harbor, were planted on these plots. The clams soon rid themselves of pollution. Snugly buried in their new home, they have already doubled in bulk, and by next year the volume is expected to be trebled. Various methods of soil improvement bid fair to speed growth and hasten the increase in number of young clams.

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ENGINEERING

Spinning Steel Balls Being Used to Test Paint

► STEEL balls, spinning at a speed of approximately 1,800 miles an hour, are being used to test the ability of paints to stick to a surface in a Navy project at the University of Cincinnati.

The tiny steel balls are only a quarter inch in diameter. Dots of paint are put on the balls which spin at a top speed of 2,400,000 revolutions per minute, suspended in a vacuum and driven by a rotating magnetic field. The device in which the balls spin is called an "ultra-centrifuge."

When the ball spins in the ultra-centrifuge, the dot of paint flies off. The speed at which this takes place is used to calculate the adhesive qualities of the paint under test. Dr. Walter Soller of the University's Applied Science Research Laboratory devised this paint-testing method.

Paints undergoing the centrifuge test are designed for highspeed aircraft. Aircraft paints, spread over the entire surface of the plane, add to the weight, so a light coating only one-thousandth of an inch thick is used. This thin coat tends to come off at high speeds, altering the weight and airflow of the airplane.

Chief factor in making paints stick to the surface of aircraft at high speeds is the adhesiveness, which is tested with the centrifuge.

In the future, the paint which goes on your house may be rated for adhesive qualities by this test, as the American Society of Testing Materials is studying the new method.

Science News Letter, February 28, 1948

IN SCIENCE

AERONAUTICS

Young Scientists Told of Race for Jet Supremacy

See Front Cover

► PROMISING future scientists were told of the dramatic struggle to develop jet engines by pioneer jet men from the Westinghouse laboratories, in the first day's program of the Science Talent Institute in Washington (Feb. 27) attended by 40 high school seniors from all over the country who are winners in the Seventh Annual Science Talent Search.

Revealed to these science-minded students were the intricacies of jet propulsion and gas turbines by men who "started from scratch" and built up one of the best-equipped jet laboratories in existence.

Reinout P. Kroon, manager, and Mark Benedict, both of the Engineering Department, Aviation Gas Turbine Division of the Westinghouse Electric Corporation, Philadelphia, demonstrated tiny jet racers, small ram-jets in action and the heating of metals to white heat to illustrate the metallurgical problems encountered in building jet engines.

Mr. Kroon said in his opening address that "Jet engines with enough power to push planes to twice the speed of sound—about 1200 miles per hour—will be possible in the next six years if development continues at the pace attained in the six years since America entered the international race for jet supremacy."

He added that "so rapid has American progress been in supplying ever increasing engine powers demanded by military air services, that in the time usually needed to double a conventional engine's power we have increased power fourfold."

Mr. Kroon was the leader in developing what he thought was an original model of the "axial flow" compressor for turbo-jets, until captured Nazi models showed that they had it, too.

On the cover of this week's SCIENCE NEWS LETTER is shown an assembled Westinghouse axial-flow gas-turbine jet propulsion engine getting its rotation test.

Science News Letter, February 28, 1948

NEW FIELDS

CHEMISTRY

New Element, Technetium, Isolated as Pure Metal

► THE WORLD'S first samples of metallic technetium, chemical element number 43, have been isolated by Dr. Sherman Fried of the chemistry division of the Argonne National Laboratory, Chicago.

One of the last four of the 96 elements to be named, technetium is now revealed to be a silvery substance similar to the other rare metals, rhenium, osmium and ruthenium, which are located near it in the scheme of the periodic table of elements.

Two tiny quantities of the metal have been carefully prepared from compounds manufactured in the atomic "furnaces" at Oak Ridge and made available for this purpose by Dr. G. W. Parker of the Clinton Laboratories. Dr. Fried reports the isolation of the new metal in a communication to the *Journal of the Chemical Society*, (Jan.).

Science News Letter, February 28, 1948

ENGINEERING

Building Better Fire Is Goal of New Research

► BUILDING a better fire—one which will burn faster, give off more heat and waste less fuel than any fire in the world—is the goal of a group of scientists at the Westinghouse Research Laboratories, Pittsburgh.

If they succeed, the better fire will mean faster, cheaper travel in the future. Better fires could be utilized by jet engines in aircraft and gas turbine locomotives and ships of the future.

The combustion research is headed by Dr. Stewart Way. His group is making a four-way attack on the problem of more efficient fires. Here are some of the problems in building a better fire:

1. How fire burns under various conditions of temperature, pressure and fuel mixture.
2. Should air be injected into a fire at angle, with a swirling motion or in a circular fashion?
3. Constructing better chambers in which to build more effective fires.
4. Development of fuel nozzles to most efficiently spray fuel into the fire.

Even measuring how fast a fire burns is a tough job. Westinghouse scientists are doing it with mirrors. Test fuel is burned in a Bunsen burner, and rays of light from a 1,000-watt mercury vapor lamp, reflected with mirrors, are used to produce an image which can be photographed and studied.

Flames have been found to travel rather slowly at about two to five feet a second in a non-moving gas. But a stream of air will speed up the flames.

Air can also make the fuel burn faster by ripping up the fuel. This is done with an oil "atomizer," which generates a miniature cyclone of air. Up to 96% of the fuel can be converted into useful heat energy with a nozzle developed by these scientists.

Instead of a standard boiler, Westinghouse scientists have made a slender, nickel-chrome steel "sleeve" for a combustion chamber. This new jet furnace has a heat release 15 times greater than that from a steam boiler for its size.

Science News Letter, February 28, 1948

ENGINEERING

New Process Uses Steam To Extract Oil from Shale

► WITH the nation shivering in the first real pinch of an oil shortage, efforts are being redoubled to find a high-efficiency, low-cost method for getting oil out of the billions of tons of our still-unused oil shales. A different approach is embodied in U. S. patent 2,434,815, which has just been granted to Richard J. Shaw of Redondo Beach, Calif.

Instead of trying to extract the oil by roasting or other external heating process, Mr. Shaw treats the crushed shale with low-pressure superheated steam as it slowly slides over a perforated plate underlain with crushed rock. The rock traps powdered shale particles in the oil that flows out, leaving the filtered oil to flow on downward into a collector. Volatile hydrocarbons mixed with the steam are condensed out and added to the oil stock, while the water from the condensation is led off for the extraction of ammonia and other valuable byproducts.

The residue of the shale, still containing unextractable but combustible solids, is discharged into a firebox, where an air blast forces it to yield the last of its fuel value for the production of more superheated steam.

The inventor has assigned his patent rights to the Union Oil Company of California.

Science News Letter, February 28, 1948

PSYCHIATRY

First Psychiatric Aide Award Given to Attendant

► A MILESTONE on the road to better care for patients in mental hospitals has been passed with the selection of the recipient for the first Psychiatric Aide of the Year Award. He is Walter Starnes of Winter Veterans Administration Hospital at Topeka, Kans.

The psychiatric aide, better known as the mental hospital attendant, is the man or woman who can be the daily and nightly friend, prop and helper of the mentally sick patient. Or the aide can be the daily and nightly terror of the helpless patients in mental hospitals.

To encourage better standards of care in mental hospitals by recognizing the value of a good attendant's services, the National Mental Health Foundation of Philadelphia has established its Psychiatric Aide of the Year awards. In their field they are the equivalent of a Nobel Prize or Hollywood's Oscars.

The award consists of \$500 and a citation. Five candidates for honorable mention have also been cited and will each receive \$50. They are: Miss Elizabeth Johnson, Ypsilanti State Hospital, Ypsilanti, Mich.; Dee Fletcher, VA Hospital, North Little Rock, Ark.; Mrs. Viola M. Griffith, St. Elizabeth's Hospital, Washington, D. C.; William Finn, VA Hospital, Northampton, Mass.; and Roy Kimberling, Middletown State Hospital, Middletown, N. Y.

Science News Letter, February 28, 1948

PHYSICS

Radioactive Soil Buried After Agriculture Tests

► RADIOACTIVE elements used in fertilizer tests on plants by U. S. Department of Agriculture scientists have necessitated a revolution in handling used soil and its greenhouse containers afterwards. Too "tricky" to be kept for reuse, both soil and containers are deeply buried.

The "trickiness" does not consist so much in danger to the experimenters (though that might enter the problem, in some cases) as in the fact that some of the stuff remains radioactive for a long time afterwards, and would falsify readings on Geiger counters if it were left lying about.

Because of this once-only use, cheap tin cans coated with enamel have replaced the familiar clay flowerpots and jars.

Science News Letter, February 28, 1948

ASTRONOMY

Spring Begins on March 20

Winter constellations are being replaced by those of spring as Bootes, the bear driver, becomes visible low in the northeast and Virgo in the southeast.

By JAMES STOKLEY

► ON the morning of Saturday, March 20, the sun reaches the halfway point in the northward journey it started just before Christmas. To a person on the equator, it then passes directly overhead at noon. This is known as the vernal equinox, and it marks the beginning of spring to those in the northern hemisphere. In southern countries, on the other hand, summer is then over, and it is the beginning of autumn.

This event, so welcome to people who have not been fortunate enough to escape from regions where snow had to be shoveled, ear muffs worn and chains put on automobiles, is also reflected in the evening skies. These are depicted on the accompanying maps as they appear at 10:00 p.m. (your own kind of standard time) on March 1, an hour earlier in the middle of the month and two hours earlier at the end.

Winter Stars Declining

Constellations that stood high in the south on early winter evenings are still with us, but declining in the west, getting ready to vanish in a couple of months. Orion is in the southwest, now in an upright position, for the star Betelgeuse, and the fainter and unnamed one just to the left of it (which is called Bellatrix) mark the shoulders of this great warrior. The three stars in a row, as marked, form his belt, while Rigel, below, is in one of his legs. To the right is Taurus, the bull, with first magnitude and ruddy Aldebaran to mark his eye. Still farther right, shown on the northern map, we find Auriga, the charioteer, with brilliant Capella.

To the left of Orion, and lower in the sky, one can see Canis Major, the great dog, with Sirius, which is the most brilliant, because it is also one of the nearest, stars visible in the night time sky. Above this is the inconspicuous constellation of Monoceros, the unicorn, and over that the lesser dog, Canis Minor, can be found. This contains another star of the first magnitude, called Procyon. Ascending still higher, we come to the twins, Gemini, with the

stars Castor and Pollux. The latter is of the first magnitude in the astronomical scale, and the former of the second. A star of one magnitude is about 2.5 times as bright as the next fainter. In order to get Sirius into this scheme, we have to go to magnitudes less than zero, so we say that it is of magnitude minus 1.6. This means, for example, that it is 6.9 times as bright as Procyon, whose magnitude is 0.5.

Spring Constellations

To take the place of the winter constellations which are getting ready to disappear, those of spring are coming into view in the east. Low in the northeast, Bootes, the bear-driver, is visible, and in this, bright Arcturus shines. The bear he is driving is Ursa Major, the great bear, of which the big dipper is part. This is just above one end of Bootes. In fact, it is a good idea to locate it first. Then by following the curve of the dipper's handle, one easily locates Arcturus.

In the southeast is Virgo, the virgin, another group typical of spring, and in which we see Spica near the horizon. Above Virgo there is a second magnitude star, Denebola, which marks the tail of Leo, the lion. The so-called "sickle," with Regulus at the end of the handle, indicates the lion's head. It is in this same part of the sky that we see two of March's three evening planets.

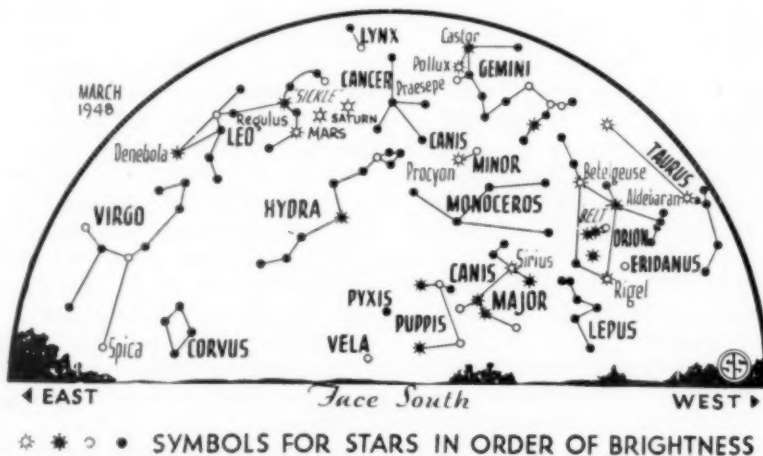
Mars, red in color, is brightest. Now drawing away from us, it is rapidly getting fainter. Fainter yet, but still brighter than Regulus, is Saturn, farther west, and just across the border into the next door constellation of Cancer, the Crab. The moon passes these planets on March 21.

Venus Is Brightest

Though it is low in the west by the times for these maps, Venus is really the brightest planet visible these evenings. It can be seen in the west long before any other star or planet comes into view, so there is little doubt about its identity. The second brightest planet is Jupiter, which is in Sagittarius, the archer, and rises a little after midnight. Mercury is a morning star this month, and can be seen low in the east just before sunrise about March 17. This is the date when it is farthest west of the sun.

When the moon reaches the full phase on March 25, it has a special significance not shared by full moons in other months. For this is the paschal full moon—the first after the vernal equinox, and the one which determines the date of Easter, which comes on the following Sunday, March 28. This rule for determining the date of Easter was established by the Council of Nicaea in 325 A. D.

Since the moon is full only five days after the equinox, Easter comes in 1948 earlier than average (which is about April 9) but not as early as it may come. For calendar purposes the equinox is taken as March 21, though as this year





it may come on the 20th. If the 21st is a Saturday, and also the day of full moon, Easter will come on March 22, as it did last in 1818. Not during this, or the next two, centuries, will it again come as early. In 1913 it came on March 23, and it will again in 2008, unless, as is likely, the calendar is reformed again before then.

The latest possible date for Easter is April 25. This happens when the moon is full on March 20, just missing the calendar equinox, and when the succeeding full moon, on April 18, falls on a Sunday. The following Sunday, April 25, is Easter, which occurred last in 1943.

Since the first day of the Jewish Passover also depends on the phases of the moon, and the vernal equinox, the Council of Nicaea decided that when the paschal full moon itself falls on a Sunday, Easter should be the Sunday next following. This prevents the beginning of Passover and Easter from ever coinciding, though they do generally come about the same time. That, however, does not happen this year, for Passover begins on Saturday, April 24. An excellent explanation of this difference has been given to the writer by Dr. G. M. Clemence, director of the Nautical Almanac, the astronomer's "bible," which is published every year by the U. S. Naval Observatory in Washington. His statement follows:

"The Passover is on a fixed date in the Jewish calendar. In accordance with the ancient Mosaic laws, the Passover begins on the evening of the 14th day of the month Nisan, which in 1948 is the evening of Friday, April 23, so that the first day of the Passover is Saturday, April 24 (Nisan 15), and is in the year 5708 of the Jewish era. The year 5708 is a leap year, in which an intercalary month is inserted preceding Nisan. This has the effect of delaying the Passover about a month. If it happens

that Easter is early, the two may be separated by a considerable interval, as occurs in 1948.

"The ancient Jewish calendar was a lunar calendar, the beginning of each month being determined by actual observation of the first appearance of the lunar crescent after sunset; and Nisan began with the new moon nearest the vernal equinox. No fixed system of intercalation (insertion of extra months) was in use. This empirical calendar was superseded many centuries ago by a calendar based on fixed arbitrary rules, and consequently the Passover no longer bears much relation to the actual moon.

"Easter originated as a counterpart and continuation of the Jewish Passover; but, likewise, in the course of time, has come to be determined by arbitrary rules which are not based on the actual moon, but on an ecclesiastical moon which is defined by conventional tables drawn up by the church. The two religious days are, therefore, essentially independent of each other and of the actual moon, although in the long run all three are in general average agreement."

Thank you, Dr. Clemence.

Time Table for March

2	11:35 a. m.	Moon in last quarter
3	3:37 p. m.	Moon passes Jupiter
7	9:00 a. m.	Moon farthest, distance 252,400 miles
8	4:47 a. m.	Moon passes Mercury
10	4:15 p. m.	New moon
13	3:36 a. m.	Algol (variable star in Perseus) at minimum brightness
14	9:57 a. m.	Moon passes Venus
16	12:25 a. m.	Algol at minimum
17	3:00 p. m.	Mercury farthest west of sun
18	7:27 a. m.	Moon in first quarter
	9:14 p. m.	Algol at minimum
20	11:57 a. m.	Vernal equinox; sun over equator and spring commences
21	2:43 p. m.	Moon passes Saturn
	6:04 p. m.	Algol at minimum
	7:16 p. m.	Moon passes Mars
23	3:00 a. m.	Moon nearest, distance 224,600 miles
24	10:10 p. m.	Full moon (paschal)
31	3:54 a. m.	Moon passes Jupiter

Subtract one hour for CST, two hours for MST, and three for PST.

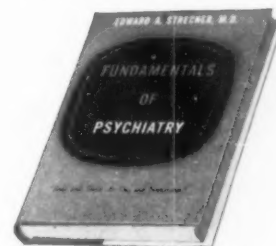
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LIPPINCOTT

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HUMAN BEHAVIOR



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Do You Know?

The cost of *highway* improvement is nearly double that of 1940.

A coin-in-the-slot, self-service *gasoline station* is in use in Australia.

The consumption of *natural rubber* exceeded that of the synthetic product during 1947 for the first time since 1943.

On the second day of this year the *earth* was at its closest point to the sun; it was some 4,000,000 miles nearer than the 94,451,000 miles that separated the two on July 5, 1947.

Airplanes on the North Atlantic trans-oceanic route are voluntarily acting as *relay stations* to forward to others radio messages received on very high frequency when normal frequency is interrupted by magnetic storms.

AGRICULTURE

Potential Fuel Wasted in Processing Farm Products

► NINE billion gallons of potential fuel are wasted each year in processing agricultural products, three U. S. Department of Agriculture scientists state.

The untapped sources of synthetic fuel include corn cobs, peanut shells and countless other agricultural wastes. Writing in the *Journal of the American Society of Agricultural Engineers* (Jan.), J. W. Dunning, P. Winter and D. Dallas of the Department of Agriculture's synthetic liquid fuels project explain that the farm wastes could be hydrolyzed into sugars which could be converted to fuels.

These synthetic fuels could not compete with natural fuels, but they would help meet demands in situations such as the present shortages.

A Department of Agriculture semi-works plant at Peoria, Ill., has begun experiments which indicate that a single ton of the farm waste can produce 90 gallons of fuel. Estimating the total of such material wasted each year at 200,000,000 tons, the scientists put the annual fuel potential at 9,000,000,000 gallons.

In addition to serving as reserve for petroleum fuels, the fuels from farm wastes also may find special applications in industry, the scientists suggest.

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ENGINEERING

New Home-Heating Device

Made of electrically conductive rubber, these panels are set in the ceiling and require no wires in their heating area. Also claimed to be economical.

► ELECTRIC heating panels set in the ceiling are the latest in home-heating devices. Their heating element is a special electrically conductive rubber; there are no wires in their heating area.

These radiant heating panels are a development of the United States Rubber Company of Passaic, N. J., and were made under the direction of C. W. Higbee. They provide an efficient system for home heating, he says, and an economical one if electricity does not cost over one and one-half cents per kilowatt hour. They have already been tested in a dozen homes throughout the country.

The panels, when properly installed, can not be distinguished from the rest of the ceiling. They look like ordinary wallboard, and are a quarter of an inch thick. Some 70% of the ceiling is covered with them in an average installation, the rest of the ceiling being covered

with standard material. The whole is then painted, papered, plastered or covered with a fabric so that the ceiling is uniform in finish.

The panels, which are four by four feet in size, consist of a layer of the rubber, which has been made conductive by a chemical process, between several layers of a phenolic plastic which is an insulator. The whole is made rigid with a backing of asbestos board, and aluminum foil is placed on the upper side to keep the heat from going upward.

Wires bring electric current to the edges of the conductive rubber, whose resistance is enough to create heat. The panels operate on 220-volt current, and are made for wattage densities of either 17 or 22 watts per square foot. The trade name for the new radiant heating panel is Uskon.

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PALEONTOLOGY

Reptile Bones Fill Gap

► SPECIMENS of therapsida, a "missing link" between reptiles and mammals, have been unearthed by the University of California Expedition in South Africa. The finds were made by Dr. Charles Camp and Dr. Frank Peabody in the Karoo desert, near Bethlehem, Cape Province.

Therapsida, dog-like in form, was the most mammal-like of reptiles and came from the same stock as the dinosaurs. It appeared in the Upper Permian, just short of two hundred million years ago. During the hundred-million-year reign of the dinosaurs it quietly evolved into true mammals, which took over on the demise of the dinosaurs. The Upper Permian rocks of North America and other parts of the world except South Africa and northern Russia are barren of Upper Permian fossils. Thus the African species may help fill a gap in the ancestry of modern living forms.

Dr. Camp said the reptiles were particularly mammalian in the structure of the lower jaw. A typical reptile has a number of bones in its lower jaw, which are

reduced to single jawbone in mammals. Dr. Camp reports excellent specimens of ictidosauria, most mammalian type of therapsida, which had an almost mammalian lower jaw. He also collected fossils of tiny reptiles and amphibians. There is one reptile skull about the size of an almond, with skeleton proportionately tiny.

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Science Service Radio

► LISTEN in to a discussion on earthquakes on "Adventures in Science" over Columbia Broadcasting System at 3:15 p.m. EST Saturday, March 6, Ralph Bodle, geophysicist at the U. S. Coast and Geodetic Survey, of the Department of Commerce, will be the guest of Watson Davis, Director of Science Service. Mr. Bodle will tell you interesting facts about earthquakes—what causes them, how they are recorded, where they occur, and other highlights.

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ORNITHOLOGY

**Cemetery Is Site of
Bird Population Study**

➤ A SEARCH for the living among the dead was abundantly rewarded in the study of the bird population of a Madison cemetery, made by George E. Koehler, 17, a senior at West High School, Madison, Wis. His records, methodically kept over a four-year period, show that the 80-acre wooded tract has no less than 106 species of bird inhabitants—with 11 more species seen winging overhead for good measure.

Greatest number of individual birds seen on any one day was 688, on a warm June day. Low point was reached after a two-day blizzard, when the only birds he could find were two bluejays.

Mr. Koehler makes a complete count of birds found in the cemetery once a month, with weekly visits during migration seasons. Along with a record of bird species present and numbers of individuals counted, he takes note also of all weather conditions, then correlates his bird counts with the environmental factors.

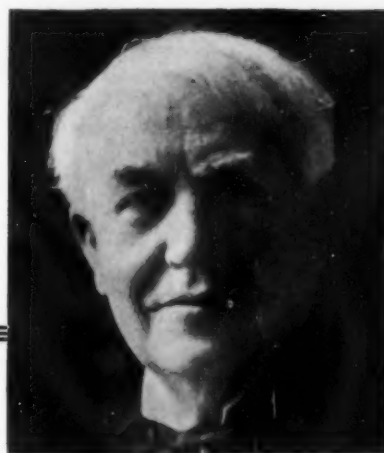
"The most significant result of these census projects," he states, "has been the amazing correlation between various weather conditions and the census figures: the effect a heavy snow will have upon the number of ground feeders present; the way a strong wind will drive the small species to the lower, more sheltered parts; the effect of the sun and the time of day on the amount of singing; and the amazing relationship between two graph lines, one representing temperature on each field trip and the other the number of individuals observed."

Together with his mother, who shares his interest in birds, Mr. Koehler has also made a detailed study of all nests found in the cemetery. In the course of his four years of observation he has found 466 nests representing 21 species. Bad weather during 1946 caused a sharp fall in the nesting population, he notes, but 1947, with weather more nearly normal, saw a comeback.

"I know that my scientific project has not added anything of great value to the science of ornithology," he concludes, modestly, "but it has added a great deal to my knowledge."

Mr. Koehler reports his bird studies in an essay submitted in connection with his participation in the Seventh Annual Science Talent Search.

Science News Letter, February 28, 1948



*Thomas A.
EDISON*

ADVANCE ANNOUNCEMENT

THE Philosophical Library, *Publishers*, deems it a privilege to announce the forthcoming publication of *The Diary and Sundry Observations of Thomas Edison*, edited by Dagobert D. Runes, and presented for the first time in book form.

Thomas A. Edison was not a desk scientist. His mind was forever searching for new paths, new ways into the mysteries that surround us, and many a precious secret was he able to wrest from Nature. This study of Edison's observations and notes is like a fascinating trip into the unknown. Here was a great scientist and a great American.

From the Table Of Contents: *On Atomic Energy, The Wars Of Tomorrow, Harnessing Of New Powers, The Habit Of Forgetting, The Inventor's Lot, Economics Of Fear, The Mystery Of Life.*

The *Diary And Sundry Observations Of Thomas Edison* will be published on April 19. Due to present conditions, the edition will be necessarily limited. Your bookseller will take your order now for a copy to be delivered on publication. You may order, if you wish, directly from the publishers by sending your remittance of \$4.75 to the

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Have We Learned?

► EXPERIENCE is proverbially the best teacher; although, it has been wryly added, a dear one. The discouraging thing is that so many of us, having taken a course in her costly though by no means exclusive school, insist on re-matriculating and immediately putting on the dunce-cap.

A new edition of Prof. Paul Sears' conservation classic, *Deserts on the March*, has just appeared. It tells again the too-familiar story of reckless and ruinous cropping methods, of soil exhaustion and erosion, of draught and dust-storms. Many of the chapters are unchanged; but they had no need for change, any more than chapters in Jeremiah or Ezekiel. The price of disobedience to the Law that sustains the world remains the same: famine, and pestilence, and desolation in the high places.

But Prof. Sears adds a new final chapter of tempered optimism, in which he dwells upon advances made in the practice of erosion control, and especially on the hard-learned willingness of farm communities to plan and plow together instead of on the destructive and often outright suicidal *laissez-faire* pattern

traditional in American agriculture. It looks quite encouraging.

However, there have again been disquieting reports from the Plains, where fleetingly favorable weather and high grain prices put an occasional premium on boom wheat farming. Big speculative operators are said to be ripping up grass-held land by tens of thousands of acres, planning to rake in the money as fast as they can while good seasons last and then to clear out, leaving the permanent farmers to reap the dust-laden whirlwind.

They almost got caught last year. At the end of his penultimate chapter, Prof. Sears writes: "Dust storms obscuring the sun for days at a time were raging when

the author began writing *Deserts on the March*; today . . . rain is falling and has been falling in the greatest quantity since the weather records began, swelling rivers into murky torrents laden with rich farm soil." That passage could not have been written later than June of 1947; for a few weeks after those ruinous rains ceased an equally ruinous drought set in. Wheat got by, but corn was caught disastrously short. And during the past fall and winter the return of the dust storms was averted by only the thinnest margin of timely snow.

Have we as a people yet learned? The coming summer may give us our answer.

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PUBLIC HEALTH

Recruiting for Health

Wartime volunteer workers may be asked to put National Health Assembly recommendations into effect in home-town war on disease.

► THE millions of women from every hamlet and city of the nation who volunteered their services to the Red Cross and similar organizations during World War II are going to be asked to serve in another war.

This time the women and the men who worked beside them will be fighting disease and needless death and crippling in their home towns. If a hospital or a diagnostic clinic is needed in the community, if the county is without a full-time health officer, if the school needs a health program, these are the women and men to get it.

Because he is convinced of the power and ability of the wartime volunteer workers, Oscar V. Ewing, Federal Security Administrator, hopes to arouse their enthusiasm to carry out recommendations of the National Health Assembly to be held in Washington May 1-4.

What the Assembly will recommend is not precisely known. It is being called as a result of a message of President Truman requesting Mr. Ewing to develop "feasible national health goals for the next 10 years."

The controversial problem of national health insurance may be discussed. But Mr. Ewing and medical leaders agree that pending settlement of that controversy there are many other non-controversial health problems that need to be attacked at once.

More doctors and dentists, medical and dental research scientists, nurses and technicians are perhaps the biggest health need of the nation at present. Greatest obstacle to improving health, either by discovery of new remedies for disease or by applying those already known, is the bottleneck in personnel.

A bill for Federal subsidy for medical education is now being prepared, Mr. Ewing said, in the hope of overcoming this bottleneck to improved national health.

Many health needs, however, are local and can best be met when the people of the locality are aroused to the need.

One problem which Mr. Ewing hopes can be solved by the National Health Assembly is the matter of the many overlapping voluntary health agencies. Often, he pointed out, such an agency has been so good that it achieved its aim. But instead of then dissolving when its mission is accomplished, it "keeps going like the bureaucrats," he said. The problem is to fit these agencies into the local health situation as it changes. Men and women in the community, he believes, can help with this.

Organizing health activities of an area on an area or regional basis, regardless of governmental organization such as townships, counties or towns, is one big thing which must, in Mr. Ewing's opinion, be done.

Science News Letter, February 28, 1948

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Books of the Week

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AN ANCIENT SITE AT BORAX LAKE, CALIFORNIA—Mark Raymond Harrington—*Southwest Museum*, 131 p., illus., paper, \$3.00. The study of a campsite some 10,000 years old.

BACKGROUND MATERIAL ON ACTIVITY IN FIRST YEAR OF DISTRIBUTION OF PILE PRODUCED RADIO-ISOTOPES—U. S. Atomic Energy Commission—*Gov't Printing Office*, 24 p., paper, 10 cents.

BRIEF PSYCHOTHERAPY—Bertrand S. Frohman with collaboration of Evelyn P. Frohman—*Lea and Febiger*, 265 p., \$4.00. To aid physicians in detecting the psychological factors that may underlie physical disorders.

THE CHALLENGE OF PARENTHOOD—Rudolf Dreikurs—*Duell, Sloan & Pearce*, 334 p., \$3.50. A book for "problem parents" intended to aid in preventing dictatorship in the home and the occurrence of those damaging childhood experiences that are at the roots of adult personality difficulties.

CHEMISTRY IN ACTION—George M. Rawlins and Alden H. Struble—*Heath*, 568 p., illus., \$3.00. An attractive text for high school.

DISABILITY EVALUATION: Principles of Treatment of Compensable Injuries—Earl D. McBride—*Lippincott*, 4th ed., 667 p., illus., \$12.00. For physicians concerned with reporting on disabilities and estimating extent of recovery. A chapter on "Employment of the Physically Disabled" is added to this edition.

ELEMENTS OF RADIO—Abraham Marcus and William Marcus—*Prentice-Hall*, 2d ed., 751 p., illus., \$4.00. Intended for use as a handbook or home study course for beginners.

FUNDAMENTAL ELECTRONICS AND VACUUM TUBES—Arthur Lemuel Albert—*Macmillan*, rev. ed., 510 p., illus., \$6.00. A college text.

THE GROWTH OF PHYSICAL SCIENCE—James Jeans—*Macmillan*, 364 p., illus., \$4.00. A book for the layman who has interests in this important field, and also for students of physics. The author corrected the proofs shortly before his death.

HANDBOOK OF CHEMISTRY AND PHYSICS: A Ready-Reference Book of Chemical and Physical Data—Charles D. Hodgman, Ed.—*Chemical Rubber Publishing Co.*, 30th ed., 2686 p., \$6.00. A revised and enlarged edition of a familiar reference book.

HYPNOTISM COMES OF AGE: Its Progress From Mesmer to Psychoanalysis—Bernard Wolfe and Raymond Rosenthal—*Bobbs-Merrill*, 272 p., \$3.00. An editor of *Mechanix Illustrated* and a former soldier with experience as a patient in Army hospitals write popularly of this technique in medicine.

IN HENRY'S BACKYARD: The Races of Mankind—Ruth Benedict and Gene Weltfish—*Schuman*, illus., \$2.00. A little book of amusing pictures setting forth a serious story exploding many of the fallacies concerning the differences between races. It is based on the much-discussed pamphlet "Races of Mankind."

THE INTEGRATIVE ACTION OF THE NERVOUS SYSTEM—Charles Sherrington—*Yale University Press*, 433 p., illus., \$6.00. A new and revised edition of a well-known book first published in 1906.

KNOW YOUR HEART—Howard Blakeslee—*Public Affairs Committee*, 31 p., illus., paper, 20 cents. Prepared by a science writer with the cooperation of the American Heart Association.

LAYOUT—Charles J. Felten—*Felten*, 132 p., illus., \$5.00. A beautiful book illustrated with photographs and drawings for artists, advertisers, and printers.

LECTURE SERIES IN NUCLEAR PHYSICS—E. M. McMillan and others—*Gov't. Printing Office*, 132 p., paper, 55 cents. Originally prepared for use of the Los Alamos scientists and later declassified.

MARINER OF THE NORTH: The Life of Captain Bob Bartlett—George Palmer Putnam—*Duell, Sloan and Pearce*, 246 p., \$3.50. The biography of an explorer written by a man who is himself an explorer.

MATHEMATICAL TABLES—Charles D. Hodgman—*Chemical Rubber Publishing Co.*, 8th ed., 366 p., Desk size \$1.75, Pocket size \$1.25. A convenient collection of reference material from the Handbook of Chemistry and Physics.

PAPERS OF THE MICHIGAN ACADEMY OF SCIENCE, ARTS AND LETTERS—Eugene S. McCartney and Henry Van Der Schalie, Eds.—*University of Michigan Press*, 325 p., illus., \$3.75.

PHARMACEUTICAL PREPARATIONS—George E. Crossen and Karl J. Goldner—*Lea and Febiger*, 2d ed., 250 p., \$4.00. Text for pharmacy students.

THE PRACTICAL HANDBOOK OF BETTER ENGLISH—Frank Colby—*Grosset & Dunlap*, 2d ed., 309 p., \$1.00. Interesting and helpful.

PRACTICAL MARINE ENGINEERING—Reno C. King, Jr.—*Prentice-Hall*, 470 p., illus., \$6.00. For the man who is going to operate a marine steam power plant.

PREHISTORIC CERAMIC STYLES OF LOWLAND SOUTH AMERICA, THEIR DISTRIBUTION AND HISTORY—George D. Howard—*Yale University Press*, 95 p., 15 pl., paper, \$1.50.

PREPARING FOR FEDERAL RADIO OPERATOR EXAMINATIONS—Arnold Shostak—*Prentice-Hall*, 404 p., \$3.75. In question and answer form.

PSYCHOLOGICAL ATLAS—David Katz—*Philosophical Library*, 142 p., illus., \$5.00. A collection of graphic material by a professor of the University of Stockholm intended for the young student but interesting to many others as well.

SIGMUND FREUD, AN INTRODUCTION: A Presentation of His Theory, and a Discussion of the Relationship Between Psychoanalysis and Sociology—Walter Hollitscher—*Oxford University Press*, 119 p., \$2.50.

TELEPATHY AND MEDICAL PSYCHOLOGY—Jan Ehrenwald—*Norton*, 212 p., \$3.00. A psychiatrist, formerly of Prague and Vienna, writes on a controversial subject. Many psychologists will probably disagree

with the views expressed.

TOWARD GENERAL EDUCATION—Earl F. McGrath and others—*Macmillan*, 224 p., \$3.00. The result of discussions, informal at first, on how education could be made to prepare young people to meet contemporary problems more effectively. The authors are members of the faculty of the University of Iowa.

TREATMENT BY DIET—Clifford J. Barborka—*Lippincott*, 5th ed., 784 p., illus., \$10.00. A technical book for physicians and dietitians.

Science News Letter, February 28, 1948

ENGINEERING

X-Rays Measure Thickness Of Red-Hot Metal Strips

► THE same X-ray that makes pictures of the interior of the human body is now measuring the thickness of red-hot metal strips emerging from the rollers in giant steel mills, too hot to be measured otherwise.

The process, with equipment revealed by General Electric, is automatic and continuous, although the metal may be moving at speeds up to 2,000 feet per minute, and there is no physical contact with the red-hot steel. A beam of X-ray which passes constantly through the steel does the trick.

At the same time another beam passes through a standard reference sample of the desired thickness. The densities of both emerging rays are picked up in a radiation detector. If the densities of the two are the same, the steels are of equal thickness. If the densities are different, the hot steel is indicated as too thick or too thin.

In conventional methods, thickness is measured by hand-held calipers which can not be used until the metal is cool. If the thickness is found incorrect, re-rolling is necessary. With the new X-ray method, adjustments can be made immediately if proper thickness is not being obtained.

Science News Letter, February 28, 1948

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☼ **ASH-TRAYS** of plated silver have clips by which they can be easily attached to the edge of a saucer on the dining table. Provided in sets, one for each smoker, they discourage putting cigaret ashes into tea cups.

Science News Letter, February 28, 1948

☼ **WHEEL ALIGNMENT** device for automobiles, recently patented, is a horizontal cross-bar which can be placed at any position from one front wheel to its mate in contact with the treads, with movable brackets which are adjusted to contact the side walls of the tires.

Science News Letter, February 28, 1948

☼ **FLAT-STEM THERMOMETER**, which can be clamped or screwed down in any desirable position to a machine part the temperature of which is wanted, enables the heat element to go snugly against the object under test, presenting a wide heat-absorbing area. It is a dial-type instrument.

Science News Letter, February 28, 1948

☼ **WINDOW WASHER** for passenger trains scoots down the side of the train while it is stopped at a station and cleans all windows in a few minutes. It is an upright revolving brush, mounted window-height on a powered platform tractor truck and water tank; the glass is sprayed as scrubbed.

Science News Letter, February 28, 1948

☼ **WATER-WARMER**, to keep drinking troughs for livestock from freezing over in cold weather, is a floating elec-



tric heater that never gets hot enough to burn or frighten the animal. No ice forms near it, as shown in the picture, and the heat is cut off by thermostatic control when not needed.

Science News Letter, February 28, 1948

☼ **SLIP-SPOOL** reel for fishing eliminates backlash in bait casting. The spool winding is at right angle to the shaft of the rod, and the line slips off the front of the reel, released by a trigger, with the forward motion of the cast. The spool is manually turned to rewind the line.

Science News Letter, February 28, 1948

☼ **LOCK AND LATCH** sets for the new home are available in unit pack-

ages, complete for all needs. The individual pieces are selected to harmonize with the architecture of the average small home, and contain among other fixtures a front door and a rear door lock both opening with the same key.

Science News Letter, February 28, 1948

☼ **POWER RECORDER** for aircraft and other engines makes a record of the total power-hour units turned out by an engine by continuously measuring the engine speed, manifold pressure and atmospheric pressure. One use is on fly-yourself planes so that customers can be charged for engine-service time.

Science News Letter, February 28, 1948

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Question Box

AERONAUTICS

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BACTERIOLOGY

How could air-borne disease germs be checked? p. 131.

ENGINEERING

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What is the new home-heating device? p. 140.

Photographs: Cover, Westinghouse Electric Corp.; p. 130, Gibbs and Hill, Inc.; p. 131, Yale University; p. 133, Bell Telephone Laboratories; p. 135, Museum of Science and Industry, Chicago.

MEDICINE

How does mental conflict express itself in the body? p. 135.

NUCLEAR PHYSICS

What is at the heart of Yale's new atom-smasher? p. 131.

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PUBLIC HEALTH

What other war may wartime volunteer workers be asked to fight? p. 142.

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